

Assignment 10

Auxiliary Machinery (continued)

Textbook Assignment: Engineman 1&C, NAVEDTRA 10543-E1, pages 7-22 through 8-21

Learning Objective: point out the operational, troubleshooting, and repairing techniques for the submerged tube and the flash-type distilling plants.

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| <p>10-1. Which of the following ships have vapor compression distilling units?</p> <ol style="list-style-type: none"> 1. Aircraft carriers 2. Submarines 3. Destroyers 4. Frigates <p>● Questions 10-2 through 10-21 refer to low-pressure submerged tube distilling plants.</p> <p>10-2. Varied operating conditions are a primary cause of which of the following problems?</p> <ol style="list-style-type: none"> 1. Changes in feed levels 2. Scaling of evaporator tubes 3. Improper liquid level in the first effect 4. Higher steam pressures <p>10-3. You need to adjust three controls in order to bring heat and fluid condition into balance. You should use which of the following techniques?</p> <ol style="list-style-type: none"> 1. Adjust all three controls simultaneously 2. Adjust all three controls singly and quickly 3. Adjust each control singly and in increments 4. Adjust each control at 10-minute intervals <p>10-4. Which of the following factors is/are most likely to cause a decrease in the plant's efficiency?</p> <ol style="list-style-type: none"> 1. Air leaks in the first tube nest 2. Low volume in the last-effect shell 3. Dirty circulating water strainer 4. All of the above | <p>10-5. Steam orifices should be inspected how often?</p> <ol style="list-style-type: none"> 1. Monthly 2. Biannually 3. Annually 4. With each overhaul <p>10-6. Water used to desuperheat live steam should be taken from what source?</p> <ol style="list-style-type: none"> 1. The first-effect tube nest drain pump 2. The second-effect tube nest drain pump 3. The freshwater supply 4. The steam feed system <p>10-7. Fluctuations in the first-effect steam pressure and temperature cause similar fluctuations in which of the following parts of the plant?</p> <ol style="list-style-type: none"> 1. The second effect only 2. The steam supply line only 3. The water levels only 4. The entire plant <p>10-8. Tubes in the first-effect tube nest should be cleaned whenever the mercury drops below which of the following levels?</p> <ol style="list-style-type: none"> 1. 1 in. 2. 1 1/2 in. 3. 2 in. 4. 2 1/2 in. <p>10-9. When you can NOT feed water into the first effect, you should look for which of the following causes?</p> <ol style="list-style-type: none"> 1. Scale deposits in the air ejector condenser 2. Scale deposits in the vapor feed heater 3. Obstructions in the feed line 4. All of the above |
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- 10-10. Once the plant is in operation, which of the following problems is most likely to cause priming?
1. A sudden rising of the water level
 2. A water level that is too high
 3. Both 1 and 2 above
 4. A sudden drop in the water level
- 10-11. The vacuum gage readings are nearly identical for the first and second effects. What is the most likely cause?
1. Air leaks between the first and second effects
 2. Equally low water levels in both effects
 3. Equally high water levels in both effects
 4. Obstructions in the flow between the first and second effects
- 10-12. You have an air leak and your watchstander has been operating the air ejectors improperly. These conditions can be expected to produce which of the following vacuum readings in the last effect shell?
1. 34 in. of mercury
 2. 30 in. of mercury
 3. 26 in. of mercury
 4. 10 in. of mercury
- 10-13. When the plant is in operation, which of the following vacuum tests may be made on joints?
1. Air pressure
 2. Candleflame
 3. Soapsuds
 4. Hydrostatic
- 10-14. A hydrostatic leak test on a nonremovable tube bundle is conducted at (a) what pressure, and (b) on what side of the unit?
1. (a) 50 psi, (b) the tube side
 2. (a) 50 psi, (b) the shell side
 3. (a) 30 psi, (b) the tube side
 4. (a) 30 psi, (b) the shell side
- Use the following situation to answer questions 10-15 through 10-17 as True or False: A low vacuum reading indicates a problem with the air ejector.
- 10-15. If you believe the problem is low steam pressure, you should try to overcome the problem by removing and cleaning the nozzle.
- 10-16. Air ejector nozzles should be cleaned with a thin rattail file.
- 10-17. A damaged strainer or nozzle should be replaced with a new one.
- 10-18. The temperature of circulating water rises more than 20°F as it passes through the distiller condenser. What should you do first?
1. Clean the air ejectors
 2. Inspect the condenser circulating water systems
 3. Check for improper operating procedures
 4. Reset the back pressure-regulating valve
- 10-19. Which of the following indicators suggests improper drainage of the distiller condenser?
1. The flash chamber gage glass is flooded
 2. The first-effect tube nest vacuum is several inches of mercury
 3. The plant does not produce designed output when the orifice is 5 psig
 4. All of the above
- 10-20. On older plants, brine density is adjusted by what control(s)?
1. The evaporator heat control valve
 2. The hand-controlled valve located in the discharge line of the brine overboard pump
 3. The wire control valve
 4. The first-effect feed valve
- 10-21. A salinometer measures the degree of salinity in a sample of brine taken from what source?
1. The discharge side of the brine pump
 2. The intake side of the brine pump
 3. The first-effect feed valve
 4. The second-effect feed valve
- Questions 10-22 through 10-29 refer to flash-type distilling plants.
- 10-22. What is the maximum design feedwater temperature?
1. 75°F
 2. 85°F
 3. 165°F
 4. 175°F

- 10-23. During operation of the plant, a pressure reduction occurs in each stage to enable the plant to
1. function with a steady, even flow of feedwater throughout the plant
 2. produce as much vapor in the fifth stage as in the first
 3. control the feedwater temperature within the specified limits
 4. produce an increased amount of vapor in each successive stage

- 10-24. Distillate leaving the cooler is pumped to storage tanks only if the salinity reading is NO greater than
1. 0.045 epm
 2. 0.055 epm
 3. 0.065 epm
 4. 0.075 epm

- 10-25. The four thermometers mounted on the saltwater heater measure which of the following temperatures?
1. Feedwater inlet and outlet
 2. Steam surrounding the tubes
 3. Desuperheating temperature
 4. All of the above

- 10-26. Cooling water from the air ejector precooler flows into which of the five heat exchangers mounted on the evaporator?
1. Second
 2. Third
 3. Fourth
 4. Fifth

- 10-27. How many inches of mercury are required in stage 5 of the evaporator?
1. 24 in.
 2. 26 in.
 3. 28 in.
 4. 30 in.

- 10-28. What is the purpose of the duplex strainer?
1. To clean steam going to the preheater air ejector
 2. To remove solid matter from seawater
 3. To remove impurities from freshwater
 4. To remove noncondensables from the saltwater heater

- 10-29. The relief valve in the feedwater inlet is set to open at what pressure?

1. 71 psig
2. 73 psig
3. 75 psig
4. 77 psig

● Questions 10-30 through 10-34 concern the maintenance of a flash-type unit, and should be judged True or False.

- 10-30. Air leakage in the brine and distillate pumps will have NO effect on vacuum.

- 10-31. The saltwater heater requires more frequent cleaning than the distillate cooler.

- 10-32. The orifices in the feed boxes are more likely to be plugged by foreign matter than by scale.

- 10-33. A relief valve that is continually popping should be scheduled for routine maintenance as time permits.

- 10-34. Pneumatic-type reducing valves should be used only for low-pressure applications.

Learning Objective: Specify maintenance and adjustments required on relief and reducing valves, and recognize some of the troubles that may be encountered with each.

- 10-35. Which of the following procedures must always be followed after a relief valve is removed?

1. Reset the spring tension
2. Reduce the pressure
3. Grind the disk
4. Grind the seat

- 10-36. A pneumatic pressure-controlled reducing valve may be used on which of the following supply lines?

1. Galley steam
2. Fuel oil
3. Freshwater
4. Each of the above

10-37. Which of the following conditions can cause a spring-loaded reducing valve to function improperly?

1. Main or auxiliary valve fails to seat properly
2. Adjusting spring requires readjustment or replacement
3. Foreign matter is deposited on the working parts of the valve
4. Each of the above

10-38. Which of the following corrective actions to a spring-loaded reducing valve may require facing-off the valve stem end to obtain the proper clearance between the diaphragm and valve stem end?

1. Lapping-in the main valve
2. Replacing the valve diaphragm
3. Grinding-in the auxiliary valve
4. Adjusting the valve spring tension

● Question 10-39 is to be judged True or False.

10-39. The proper water seal level is maintained in the upper half of the dome on the pneumatic pressure-controlled reducing valve by steam condensation.

10-40. When a pneumatic pressure-controlled reducing valve is being installed or replaced, care must always be taken to replace which of the following seals?

1. The water seal in the upper half of the dome
2. The water seal in the lower half of the dome
3. The glycerine seal in the upper half of the dome
4. The glycerine seal in the lower half of the dome

10-41. Assume that, when repairing a pneumatic pressure-controlled reducing valve, you lose the water seal. Why must you replace the water seal before putting the valve back in service?

1. To prevent the glycerine from contacting the diaphragm
2. To prevent the steam from contacting the diaphragm
3. To allow the glycerine to come in contact with the diaphragm
4. To allow the steam to come in contact with the diaphragm

10-42. If the glycerine of a pneumatic pressure-controlled reducing valve must be replenished and NO glycerine is available, which of the following actions should you take?

1. Leave the lower seal empty for the time being
2. Use water for the lower seal until you can get glycerine
3. Use oil for the lower seal until you can get glycerine
4. Shut off the valve and tag it inoperable until you can get glycerine for the lower seal

10-43. The discharge pressure of a reducing valve increases above the desired amount. What is the most likely cause of this?

1. A broken spring
2. Failure of the diaphragm
3. A change in air temperature
4. Poor valve seating due to dirt or water

10-44. A check on a closed reducing valve which has failed to deliver steam shows that the dome pressure gage reads the same as the outlet pressure gage. What is the likely cause of this problem?

1. The diaphragm has failed
2. The valve stem is binding
3. The filling plug is leaking air
4. Temperature changes are causing the air to expand

10-45. In case of an oil spill, which of the following persons will be assigned the specific responsibility to direct the cleanup operation?

1. CNO
2. On-scene coordinator
3. Area coordinator
4. On-scene commander

● Question 10-46 is to be judged True or False.

10-46. In the Navy, only major Navy-related spills must be reported.

10-47. The person responsible for maintaining a detailed log of spill-related activities is the

1. CNO
2. area coordinator
3. on-scene coordinator
4. on-scene commander

- 10-48. The first corrective actions to be taken as soon as possible after a spill has been discovered are known as
1. discovery and notification
 2. containment and countermeasures
 3. recovery and disposal
 4. documentation and cost recovery
- 10-49. What is the main reason for isolating and evacuating a spill area?
1. To protect life
 2. To protect health
 3. Either 1 or 2 above
 4. To protect the environment
- 10-50. Booms are available in various heights and depths designed to meet their use requirements under various wind and sea conditions. What is the usual length of a boom?
1. 25 ft
 2. 50 ft
 3. 75 ft
 4. 100 ft
- 10-51. Procedures to contain oil spills on land depend on all but which of the following factors?
1. Amount of oil
 2. Type of oil
 3. Source of oil
 4. Type of soil
- 10-52. A spill of JP-4 is allowed to evaporate. This is an example of
1. fuel removal
 2. fuel containment
 3. fuel isolation
 4. fuel evacuation
- 10-53. Which of the following methods of fuel removal may be allowed only if the oil can NOT be removed by other means?
1. Biodegradation
 2. Burning
 3. Dispersion
 4. Evaporation
- 10-54. Physical-mechanical methods of oil removal include the use of skimmers. Which of the following types of skimmers is based on the Weir principle and is designed for use in congested harbor areas?
1. Small
 2. Large
 3. Suction base
 4. Sorbent surface
- 10-55. Which of the following types of skimmers work best in calm, debris-free waters because of their high susceptibility to wave action and clogging?
1. Small
 2. Medium
 3. Large
 4. Suction-based
- 10-56. The Mark I Spill Control Kit is best used with which of the following kinds of oil spills?
1. Protected open-water spills
 2. Small ship-side spills
 3. Congested harbor area spills
 4. Large area spills
- 10-57. The use of which of the following agents is prohibited by Federal regulations?
1. Emulsifiers
 2. Sinking agents
 3. Gelling agents
 4. Burning agents
- Question 10-58 is to be judged True or False.
- 10-58. Whenever possible, the oil collected from a spill should be burned.
- 10-59. Which of the following is the cause of the majority of oil spills?
1. Human error
 2. Obsolete equipment
 3. Leaky containers
 4. All of the above
- 10-60. Regulations that require the Navy to control sewage discharge were promulgated by the
1. President of the United States
 2. Secretary of Defense
 3. Secretary of the Navy
 4. Chief of Naval Operations
- 10-61. In what year was the decision made to install CHT systems aboard ships?
1. 1970
 2. 1972
 3. 1976
 4. 1980

10-62. On large ships, the goal of the CHT system is to provide the capacity to hold shipboard sewage generated over what period of time?

1. 24 hr
2. 12 hr
3. 6 hr
4. 3 hr

10-63. All internal surfaces of CHT tanks must be coated in accordance with which of the following publications?

1. Naval Ships' Technical Manual, Ch 631 (9190)
2. Naval Ships' Technical Manual, Ch 503 (9470)
3. NAVFAC P-908
4. OPNAVINST 6240.3E

10-64. Comminutor and aeration systems are used with ships whose holding tanks' capacities are at least

1. 1000 gal
2. 2000 gal
3. 3000 gal
4. 4000 gal

10-65. A high level alarm sounds. What immediate action should you take to prevent flooding of the spaces?

1. Close isolation valves on the upper and the lower drains
2. Open the isolation valves on the upper and the lower drains
3. Close isolation valves on drains below the overboard discharge and divert the upper level drains overboard
4. Open isolation valves on drains below the overboard discharge and divert the upper level drains overboard

● Question 10-66 is to be judged True or False.

10-66. Exposure to continued or intermittent sounds can cause loss of hearing.

10-67. Loss of hearing sensitivity generally occurs in which of the following ranges?

1. 6,000 to 10,000 Hz
2. 4,000 to 6,000 Hz
3. 3,000 to 4,000 Hz
4. 500 to 3,000 Hz

10-68. What is the purpose of the hearing conservation program?

1. Identify noise sources
2. Reduce exposure of personnel to potentially hazardous noises
3. Test the hearing of noise-exposed personnel
4. Provide hearing-conservation devices

● Question 10-69 is to be judged True or False.

10-69. All personnel who are exposed to potentially hazardous noise may wear hearing protection devices at their own discretion.